

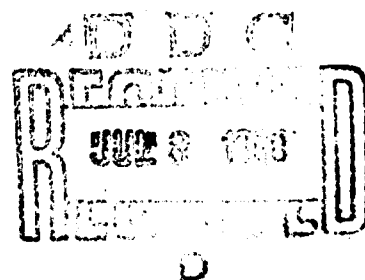
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NOTES ON THE PHYSICAL STATE OF THE PRISONER OF WAR
AS IT MAY AFFECT BRAIN FUNCTION

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The human brain functions optimally within the same narrow range of physical and chemical conditions that limit the functions of human organs generally. The brain has, in addition, certain special limitations of its own. Any circumstance that impairs the function of the brain potentially affects the capacity of a man to control his behavior. His ability to give information is affected as well as his ability to withhold it.

Brain function is readily impaired by disturbances of homeostasis. It is easily disordered by physical abnormalities that affect the body as a whole, including such common conditions as fever, a profound lowering of body temperature, dehydration, overhydration, disturbances in the composition of the blood, disturbances of respiration, shock, hemorrhage, diarrhea, vomiting, poisonings, starvation (partial or complete) and even static postures that are long maintained. The disturbance of brain function produced by each of these--and indeed that produced by an homeostatic disturbance, or by any physical or chemical assault upon the brain--is remarkably uniform in many of its features. Even though the symptoms produced by any given homeostatic disturbance (such as overbreathing or dehydration for example), many exhibit certain idiosyncratic features (such as muscle cramps or thirst). There are fundamental common elements in the disturbances of brain function that follow from all these types of assault.

The brain of man is an organ that deals with "information," using this term in the technical sense in which it is used in communications theory.

Deprived of information, it does not function normally. It must have a certain quantity of patterned, meaningful sensory input from the environment, and some opportunity to organize its output as behavior. Nor can it perform one sort of activity continuously over extended periods of time and maintain its efficiency. Even though the task undertaken is entirely "mental" (or, as one might say, it involves only the carrying out of activity within the brain) and no significant changes in the general physical state of the individual occur as a result of it, the phenomenon of "fatigue" eventually supervenes, and brain function deteriorates. In addition to this, the brain requires "sleep" from time to time--a cessation of its "conscious" pattern of activities. Otherwise its functions suffer. Thus the brain has special vulnerabilities of its own: it cannot function "normally" unless it receives a certain amount of information upon which to operate, and it cannot carry out a single pattern of activities unremittingly and indefinitely.

Hunger, pain, signals of danger, and similar forms of sensory input have not been shown to be directly toxic to the human brain; for it appears that under the right circumstances any individual can tolerate them indefinitely. The weight of evidence is that it is not the sensory input itself, but the reaction of the individual to this input which may adversely affect his brain function. This is not the case with isolation, sleep deprivation and fatigue; here the effects are intrinsically adverse, and the reaction of the individual is a factor only in determining how long these effects can be withstood. But with hunger, pain, signals of danger, and similar forms of sensory input, the adverse effects upon brain function may be entirely the result of the reaction of the individual. This reaction may set in

motion patterns of activity within the internal organs which may so alter the function of the cardiovascular, gastrointestinal, respiratory, or other organs systems, that the ultimate effect is to create a disturbance of homeostasis which leads to an impairment of brain function. This special vulnerability of the brain to its own activities long suspected by clinical observation, has recently received some experimental verification.

When brain function is impaired by any of these factors, the first functions lost are those that are thought to be the most complex and to have been acquired most recently by civilized man: the capacity to carry out the highest creative activities, to meet new, challenging, and complex situations, to deal with trying interpersonal relations, and to cope with repeated frustration. Relatively small degrees of homeostatic derangement, fatigue, pain, sleep loss, or anxiety may impair these functions.

As impairment of brain function continues, somewhat less complex activities deteriorate. There is a lessening of the speed and efficiency with which the ordinary tasks of daily life are carried out. Concern about "accuracy," "propriety," "moral rectitude," "honor," and "feelings of other people" and similarly "socially oriented" behavior falls away, and an increased concern about sleep, rest, comfort, food, and other bodily needs becomes apparent. There is less adherence to niceties in speech, behavior, and dress. Emotional displays lose some of their social orientation. Judgment and insight are less acute. These complex aspects of brain function may be distinctly impaired while orientation, memory, recall, and the capacity to perform well on psychomotor tests are still intact.

Symptoms of disturbed orientation appear as impairment of brain function proceeds. Memory becomes faulty. The capacity to recall remote events

is retained after the memory for recent events is lost. Difficulty in simple computation becomes evident, and impairment of performance on tests becomes quite noticeable. With further deterioration of brain function, loss of contact with reality and finally loss of consciousness occur.

Disordered brain function is easily produced in any man. No amount of "will power" can prevent its occurrence. It can be produced "without using physical means" for example, by fatigue or sleep deprivation. Since it may be associated with mental clouding, confusion, and lack of discrimination, it is probably true that most men can be brought to a state where they will agree to statements that are dubious, incomplete, or quite inaccurate, or exhibit behavior not entirely in keeping with that expected of members of the armed services. Under these circumstances, some men will make up entirely fictitious stories incriminating themselves, or damaging to their military service or their country. Therefore it is usually not difficult to obtain signed statements that are biased, incomplete, inaccurate, or even totally untrue, or to elicit behavior that involves various degrees of "collaborating with the enemy." But it is to be emphasized that such methods do not by any means meet with universal success in producing the kinds of statements and behavior that a captor may desire; nor is it necessarily true that most--or even a great many--of the instances of collaboration, defection, or breach of security which may occur in a given group of prisoners of war are in any way the result of what we have here called "disturbances of brain function."

Disturbed brain function in a prisoner does not allow an interrogator to extract information at will, or make it possible to elicit any given form of compliant behavior. There is no evidence that a man must always reveal a specific item of information that he possesses. Some prisoners have been able to endure to death or disorganization without committing acts desired by

the captors. However, very few men seem to be able to hold themselves completely to such rigorous behavior throughout all of the vicissitudes of a long captivity.

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